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EXAMINER

BOBISH, CHRISTOPHER S

ART UNIT

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/531,207	<b>Applicant(s)</b> ISHIKAWA ET AL.	
	<b>Examiner</b> CHRISTOPHER BOBISH	<b>Art Unit</b> 3746	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 23 December 2008.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 15, 16 and 18-27 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 15, 16 and 18-27 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 112***

Applicant has amended claims 15 and 22 to further clarify the proposed invention. Therefore the rejection of claims 15 and 22 due to indefiniteness has been withdrawn.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 15, 25, 26 are rejected under 35 U.S.C. 102(b) as being anticipated by Takabayashi (US Patent No. 4,741,978).

limitations from claim 15, a hydrogen operated power system, comprising: a supply system which supplies a gaseous fuel from a fuel supply tank, **C. 2 Lines 31-34**, to a hydrogen operated power source, **FIG. 2 (1) C. 2 Line 27**; and a pump, **FIG. 2 (5) C. 2 Line 34**, provided in the supply system, which is driven by a sensorless motor, **FIG. 2 (6) C. 2 Line 36**; and an abnormality detecting portion, **FIG. 1 (24, 25, 26) C. 3 Lines 20-46**, which detects a plurality of types of different abnormalities related to driving the motor; and an abnormality determining portion, **FIG. 1 (21) C. 3 Lines 18-28**, which determines that an abnormality has occurred in the supply system when an abnormality has been detected a predetermined number of times by the abnormality detecting portion **(24, 25, 26)** after an instruction has been given to start the motor until a predetermined period of time has passed, **C. 4 Lines 17-38**;

limitations from claim 25, wherein the abnormality detecting portion detects, as one of the plurality of abnormalities, at least one of an over-current abnormality in

Art Unit: 3746

the motor, a short-circuit current abnormality in an element in the motor, and a lock abnormality in the motor, **C. 3 Lines 39-49;**

limitations from claim 26, wherein the hydrogen operated power source **(1)** is a fuel cell, **C. 2 Line 26;**

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 15 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takabayashi (US Patent No. 4,741,978) in view of Takatoshi et al (EP 1 235 340 A2) as in the IDS.

Takabayashi teaches:

limitations from claim 15, a hydrogen operated power system, comprising: a supply system which supplies a gaseous fuel from a fuel supply tank, **C. 2 Lines 31-34**, to a hydrogen operated power source, **FIG. 2 (1) C. 2 Line 27;** and a pump, **FIG. 2 (5) C. 2 Line 34**, provided in the supply system, which is driven by a motor, **FIG. 2 (6) C. 2 Line 36;** and an abnormality detecting portion, **FIG. 1 (24, 25, 26) C. 3 Lines 20-46**, which detects a plurality of types of different abnormalities related to driving the motor; and an abnormality determining portion, **FIG. 1 (21) C. 3 Lines 18-28**, which determines that an abnormality has occurred in the supply system when an abnormality has been detected a predetermined number of times by the abnormality detecting portion **(24, 25, 26)** after an instruction has been given to start the motor until a predetermined period of time has passed, **C. 4 Lines 17-38;**

Art Unit: 3746

Takabayashi teaches a motor without mentioning a sensor, however Takatoshi specifically teaches the need for a pump motor to be constructed without sensors:

limitations from claim 15, a pump (7) and a sensorless motor (8) for driving said pump, **C. 2 paragraphs [0008, 0009] and C. 6 paragraphs [0042, 0045];**

**It would have been obvious to one having ordinary skill in the art of pump/motor systems at the time of the invention to provide a sensorless motor as taught by Takatoshi to drive the pump taught by Takabayashi in order to increase the motor durability due to the lack of any fragile sensors.**

Claims 15-16, 18, 20, 21, 23, 26 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nonobe et al (USPGPUB No. 2002/0094467 A1) in view of Takatoshi et al (EP 1 235 340 A2) as in the IDS.

Nonobe teaches:

limitations from claim 15, a hydrogen operated power system, comprising: a supply system which supplies a gaseous fuel from a fuel supply tank, **FIG. 4 (300) ¶ 80**, to a hydrogen operated power source, **FIG. 4 (100) ¶ 26 and 75**; and a pump; and an abnormality detecting portion which detects a plurality of types of different abnormalities related to driving a motor; and an abnormality determining portion which determines that an abnormality has occurred in the supply system when an abnormality, regardless of type, has been detected a predetermined number of times by the abnormality detecting portion after an instruction has been given to start the motor until a predetermined period of time has passed, **¶ 72-73 and 81**;

Nonobe does not teach a sensorless motor, but Takatoshi does.

Takatoshi teaches:

limitations from claim 15, a pump (7) and a sensorless motor (8) for driving said pump, **C. 2 paragraphs [0008, 0009] and C. 6 paragraphs [0042, 0045];**

Art Unit: 3746

**It would have been obvious to one having ordinary skill in the art of pump/motor systems at the time of the invention to provide a sensorless motor as taught by Takatoshi to drive the pump taught by Nonobe in order to increase the motor durability due to the lack of any fragile sensors.**

Nonobe and Takatoshi disclose and teach of the power system in claim 1.

Nonobe further teaches:

limitations from claim 16, wherein a supply system circulates the gaseous fuel supplied from the fuel supply tank **(300)** to the hydrogen operated power source **(100)** via a circulation path, **FIG. 4 (401, 403) ¶ 80**, so as to supply the gaseous fuel to the hydrogen operated power source, and the pump **(410)** circulates the gaseous fuel in the circulation path, **¶ 85**;

limitations from claim 18, wherein a supply system is provided with a check valve, **FIG. 4 (426) ¶ 80**, mounted on a discharge side of the pump **(410)**, and the abnormality determining portion determines sticking of the check valve to be an abnormality in the supply system, **¶ 72 discusses the failure of a valve (404) to be a detectable abnormality in the system, and while this is not the check valve immediately at the discharge side of the pump, examiner believes that the malfunction of the check valve (426) would cause similar pressure changes and it would have been obvious to one having ordinary skill in the art to monitor this valve for failure as well or in place of the other valve (404)**;

limitations from claim 20, further comprising a pressure detecting portion which detects a pressure on the discharge side of the pump, and the abnormality determining portion determines whether the check valve is stuck based on the pressure detected by the pressure detecting portion, **the upper half of ¶ 72 teaches a valve failure leading to a detectable pressure change in the system**;

limitations from claim 21, further comprising a system stopping portion which stops the system when it has been determined by the abnormality determining portion that there is an abnormality in the check valve, **¶ 72-73**;

limitations from claim 23, further comprising: an abnormality detecting portion which detects a plurality of types of different abnormalities related to driving of the motor; and a system stopping portion which stops the system when an abnormality, regardless of type, has been detected a predetermined number of times within a predetermined period of time by the abnormality detecting portion, **¶ 72-73**;

limitations from claim 26, wherein the hydrogen operated power source is a fuel cell, **FIG. 4 (100) ¶ 77**;

Art Unit: 3746

limitations from claim 27, wherein the hydrogen operated power system is a hydrogen engine, ¶ 3 - ¶ 5.

Claims 19, 20 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nonobe et al (USPGPUB No. 2002/0094467 A1) in view of Takatoshi et al (EP 1 235 340 A2) as applied to claims 15, 17 and 18 above, and in further view of Ferguson et al (US Patent No 6,463,949 B2).

Nonobe and Takatoshi teach and disclose of the power system of claims 17 and 18.

Ferguson further teaches:

limitations from claims 20 and 21, a method of detecting valve failure based on system pressure, and shutting the system down when an abnormality occurs, C. 5 Lines 11-23;

**It would have been obvious to one having ordinary skill in the art of pumps/valves at the time of the invention to combine the method of detecting abnormalities in valves as taught by Ferguson with the power system of Nonobe as modified by Takatoshi in order to protect the system from damage C. 1 Lines 18-23;**

limitations from claim 19, further comprising an outside air temperature detecting portion which detects an outside air temperature, and the abnormality determining portion determines whether the check valve is stuck based on the outside air temperature detected by the outside air temperature detecting portion, C. 1 Lines 18-23 of Ferguson teach that temperature of a fluid can be monitored in order to detect an abnormality in a valve, it would have been obvious to one having ordinary skill in the art of fuel pump systems to monitor the temperature outside of the system alternatively, as is known in the art of fuel systems, to monitor a valve;

Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nonobe et al (USPGPUB No. 2002/0094467 A1) in view of Takatoshi et al (EP 1 235 340 A2) in view of Ferguson et al (US Patent No 6,463,949 B2) as applied to claims 15, 17, 18, 20 and 21 above, and in further view of Sugawara et al (US Patent No 7,279,242 B2).

Nonobe, Takatoshi and Ferguson teach and disclose of the pump of claims 15, 17 and 18.

Neither Nonobe nor Takatoshi teach of monitoring an outside air temperature; Ferguson teaches monitoring a temperature of fluid inside the system, to check a valve status.

Sugawara teaches a section to monitor an outside air temperature of a system to control a valve.

limitations from claim 19, further comprising an outside air temperature detecting portion which detects an outside air temperature, **C. 6 Lines 52-63**;

**It would have been obvious to one having ordinary skill in the art of pump/valve systems at the time of the invention to combine the temperature sensing system of Sugawara with the power system taught by Nonobe and modified by Takatoshi and Ferguson in order to prevent system damage by running a pump/motor while an abnormality in the system exists. Furthermore, one of ordinary skill in the art would be able to conclude from Sugawara that an abnormal change in temperature measured would be related to the function of a valve.**

Claims 22 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nonobe et al (USPGPUB No. 2002/0094467 A1) in view of Takatoshi et al (EP 1 235 340 A2) as applied to claims 15, 17, 18 and 23 above, and in further view of Clack et al (US Patent No. 6,017,192).



Art Unit: 3746

Nonobe and Takatoshi teach and disclose of the power system of claims 15, 17, 18 and 23.

Neither Nonobe nor Takatoshi teach of a restart instructing portion, but Clack does.

Clack teaches:

limitations from claims 22 and 24, a restart instructing portion instructing a system to restart when an abnormality has been detected, and stopping the system when the restart portion determines there is an abnormality, **C. 11 Lines 36-54 and C. 12 Lines 44-67;**

**While Clack teaches a method of controlling a refrigeration system rather than a fuel system, both are fluid moving circuits and it would have been obvious to one having ordinary skill in the art of pumps/motors at the time of the invention to provide the system taught by Nonobe and modified by Takatoshi with the monitoring system taught by Clack in order to protect the system from damage due to prolonged running with undetected failures.**

### ***Response to Arguments***

Applicant's arguments filed 12/23/2008 with respect to the Takabayashi reference have been fully considered but they are not persuasive.

Applicant's arguments with respect to claims 15-16, 18, 20, 21, 23, 26 and 27 have been considered but are moot in view of the new ground(s) of rejection.

With respect to applicant's arguments pertaining to amended claim 15 and the Takabayashi reference, the examiner disagrees with the applicant. The examiner agrees that the motor is not explicitly described as "sensorless"; however as Takabayashi does not teach a sensor on the motor or a particular need for having a sensor on the motor, the motor is assumed to be without a sensor and therefore "sensorless". The benefits of a sensorless motor as recited by the applicant in

Art Unit: 3746

paragraphs [0009, 0022 and 0028], while not described by Takabayashi, are at the very least considered as inherent properties of the Takabayashi reference.

Applicant also argues that Takabayashi does not read on the newly amended portion of claim 1 involving an abnormality determining portion. Examiner notes that in the arguments provided on Page 7 of the applicant's remarks, the language used to refute the Takabayashi reference is narrower than in the claims; specifically looking at the underlined portions referring to the applicant's device "counting the number of abnormalities". Examiner agrees with the applicant that Takabayashi does not discuss a counting of abnormalities to minimize erroneous abnormality determinations; however this limitation is not contained in the claims. Therefore the rejection of claim 1 including the limitations collapsed from claim 17 is maintained.

With respect to the rejection of newly amended claim 1 using the Nonobe reference, the applicant has argued that an abnormality detecting portion is not taught by Nonobe. However, paragraph 72 describes a relief valve that is opened when a "pressure of the hydrogen gas as *measured* in a portion of the main stream passage...is raised to be equal to or higher than a predetermined level". Examiner contends that this reads on a detecting portion and a determining portion for monitoring abnormalities. Furthermore, paragraph 81 teaches a controller 50 (determining portion) receiving a signal from a sensor 400 (detector) controlling the operation of the system during use. Examiner believes that both of these embodiments read on the limitations of claim 1 as rejected above. Again, it is noted that the limitations referring to counting abnormalities

Art Unit: 3746

provided and argued by the applicant on Page 8 of the remarks are narrower than those claimed.

### ***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CHRISTOPHER BOBISH whose telephone number is (571)270-5289. The examiner can normally be reached on Monday through Thursday, 7:30 - 6:00.

Art Unit: 3746

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Devon Kramer can be reached on (571)272-7118. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Christopher Bobish/  
Examiner, Art Unit 3746

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